REMARKS/ARGUMENTS

In response to the Office Action mailed June 2, 2005, Applicants amend their application and request reconsideration. In this Amendment no claims are cancelled or added so that claims 1-10 remain pending.

Claims 7-10 were stated to be allowed so that there is no further comment on those claims. Some non-substantive amendments are made in those claims to improve their form.

Claims 3 and 6 were stated to be allowable. No further comment is required. Some non-substantive clarifying amendments are made to claims 3 and 6

In this Amendment claim 1 is amended to describe the arrangement of the permanent magnets in each of the rows. The first paragraph of claim 1 is reformatted to make clearer the description of the arrangement of the permanent magnets. As described in that first principal paragraph of claim 1, closest pairs of the permanent magnets in each of the rows are separated from each other by respective gaps. These gaps are clearly depicted in the pictorial figures of the patent application, such as Figures 1, 2A, 2B, 3, 4, 10, 11, 15-17, 20, and 21A-21D. By providing these gaps, magnetic interference between the respective permanent magnets due to stray flux is reduced. In fact, in preferred embodiments of the invention, this magnetic interference due to the rotor becomes almost negligible. The remaining magnetic interference principally relates to the stator.

As explained in the patent application, the magnetic properties of the stator may change over time with the deterioration of the stator core. This phenomenon is described in the patent application from at least page 11, line 13 through page 12, line 17. An effect, described there, of the deterioration of the magnetic properties of the stator core is an increase in the row-to-row skew angle at which the cogging torque ratio is minimized. An example of changing magnetic properties is illustrated in Figure 7 of the patent application. The three curves plotted there show the theoretical magnetic property, curve A, the actual magnetic property observed in initial performance, curve B, the actually experienced magnetic property after deterioration due to normal operation, curve C, for magnetic material of the stator core. As shown by the cited discussion, the amount of magnetic interference affecting the skew angle at which the cogging torque ratio is minimized, increases with the deterioration of the magnetic properties. The presence of the gaps between the adjacent pairs of permanent magnets is therefore important in maintaining the properties of the rotating magnetic machine over time. Specifically, a rotating magnetic machine according to the invention permits an increase n the upper limit of the skew angle, extending the use of the machine as the magnetic properties deteriorate.

In this Amendment claims 4 and 5 are clarified by explaining the meaning of the term "equiangular points". As can be seen in Figures 2A, 2B, and 4 of the patent application in some embodiments, the rotor poles are located at equiangular, i.e., symmetrical, positions around the circumference of the rotor. The locations of the poles in the embodiment of Figure 11, to which claims 4 and 5 pertain, lack the same kind of symmetry.

Claims 1, 2, 4, and 5 were rejected as unpatentable over Nishiyama (JP 2000-308286) in view of Fukushima (U.S. Patent 6,657,349). This rejection is respectfully traversed.

It appears that claim 1 was not properly understood and therefore incorrectly rejected. Applicants respectfully note that there appear to be a number of contradictions in the Official Action. For example, at page 2 of the Official Action the Examiner states that Nishiyama discloses a motor having a rotor and directs attention to Figures 1-4 of Nishiyama. Yet, at page 4 of the Official Action, the Examiner states that Nishiyama does not disclose a rotor having a rotor core carrying on its curved outer surface multiple permanent magnets. An inspection of Figures 1-4 of Nishiyama indicates that the second statement is untrue. At that page 4 of the Office Action the Examiner states in a paragraph (b) that Nishiyama fails to disclose information about calculation of a skew angle. It does not appear that there is any assertion that Fukushima or any other reference discloses what is mentioned in paragraph (b) of the Office Action unless there is a typographical error, for example at page 5, of the Office Action.

Claim 1 is the sole rejected independent claim. If that claim is patentable over the asserted combination of Nishiyama and Fukushima, then clearly claims 2, 4, and 5 are patentable over that combination.

While a long discussion of the two references could be provided, it is sufficient to point out that neither Nishiyama nor Fukushima describes a rotating magnetic machine that includes a rotor having adjacent pairs of permanent magnets that are spaced apart from each other as in the invention according to claim 1. Therefore, no combination of Nishiyama and Fukushima could include all of the limitations of claim 1 so that *prima facie* obviousness of claims 1, 2, 4, and 5 cannot be established by those two publications.

Moreover, it is clear that Fukushima recognizes the problem which the present invention solves. At column 3, lines 1-2, the problem of magnetic interference is discussed. Fukushima points out in this passage that the magnetic interference prevents the skew angle, in a prior art publication, from matching an optimum angle at which cogging torques cancel each other. However, the Fukushima purported solution to the problem is different from the invention. On this additional ground, there is no basis upon which to reject any of the four claims as obvious over Nishiyama in view of Fukushima.

Applicants also bring to the Examiner's attention the fact that the subject matter of examined claims 4 and 5 pertain to the second embodiment of the invention described in the patent application with respect to Figures 10 and 11 at pages 15-17 of the patent application. Turning briefly to those figures, and particularly to Figure 11, it can be seen that Figure 11 is a plan view of one of the rows of permanent magnets, such as the rows 32a and 32b shown in a perspective view of Figure 10. As explained in the patent application and in examined claims 4 and 5, the north and south poles that are adjacent to each other in that row of permanent magnets are not symmetrically arranged around the circumference of the row. Rather, there is an angular offset between respective pairs of north and south poles as described in claims 4 and 5. As pointed out in the patent application, this arrangement provides a reduction in the fundamental component and the second harmonic component of the cogging torque. See pages 16 and 17 of the patent application. Nothing similar is disclosed in either of Nishiyama or Fukushima and there is no explanation for the ground of rejection of claims 4 and 5 in the Official Action. Accordingly, upon reconsideration, the rejection of claims 4 and 5 must be withdrawn, independent of the action taken with respect to claims1 and 2.

Since all claims now pending were either allowed or stated to be allowable, with the exception of claim 1, 2, 4, and 5, and amended claim 1 is clearly patentable, all claims now pending are clearly patentable over the prior art. Therefore, all of claims 1-10 should now be allowed.

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